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(71)Applicant : NEC ENG LTD

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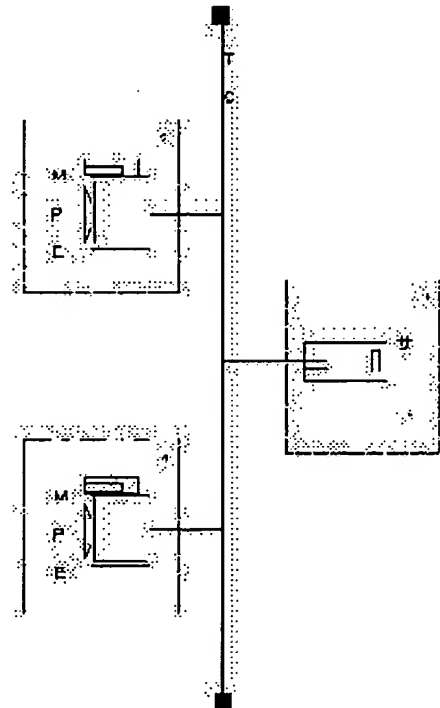
(72)Inventor : NOBE SHINICHI
SAITO MINORU

(54) VIDEO CONFERENCE SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To solve a problem that real time property is damaged and a flexible connection form is difficult in the case of performing a video conference of a large scale through a narrow band LAN because data to be communicated are large in a television conference system based on ITU-T recommendation.

SOLUTION: Terminals 1 transmit multimedia data obtained by encoding video/sound data by MPEG-4 and MP4 formats to a server device 3, which streaming-distributes the multimedia data to all the terminals connected to the video conference system. The terminals 1 decode the multimedia data from the device 3 to the video/sound data. An H.320 terminal 31 and an H.323 terminal 33 can hold an MPEG-4 style video conference system by intermedating conversion processors 33 and 35 provided with the function of an MPEG-4 terminal.



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CLAIMS

[Claim(s)]

[Claim 1] In the video conference system which has the server equipment which manages connection and a communication link of a video conference system, and two or more terminals connected to the server equipment concerned The image input device into which said terminal inputs image data, and the audio input unit which inputs voice data, With the connection Management Department which manages the terminal which has the transmitting processing section which transmits said image data and voice data to said server equipment, and connects said server equipment to a video conference system It has the message distribution processing section which carries out streaming distribution to all the terminals that have managed the speaker selection Management Department which chooses a speaker and sends out a selection signal, all the image data distributed from said two or more terminals, voice data, and said selection signal at said connection Management Department. Further said terminal The image output unit which displays the image data distributed from said server equipment, The video conference system characterized by having the audio output device which outputs the voice data chosen from the selection signal and voice data which have been distributed from said server equipment in the speaker selection processing section which chooses the voice data corresponding to a speaker, and the speaker selection processing section concerned.

[Claim 2] In the video conference system which has the server equipment which manages connection and a communication link of a video conference system, and two or more terminals connected to the server equipment concerned said terminal The image input device which inputs image data, and the audio input unit which inputs voice data, The encoding processing section which encodes said image data and voice data to image compressed data and speech compression data (henceforth "multimedia data"), respectively, It has the transmitting processing section which transmits the multimedia data concerned to said server equipment. Said server equipment It has the message distribution processing section which carries out streaming distribution to all the terminals that have managed the connection Management Department which manages the terminal linked to a video conference system, and all the multimedia data transmitted from said two or more terminals at said connection Management Department. Furthermore, the decoding section which decrypts the image compressed data and speech compression data with which said terminal has been distributed from said server equipment to image data and voice data, respectively, The video conference system characterized by having the image output unit which was decrypted in the decoding section, and which outputs the image data concerned, and the audio output device which outputs the voice data concerned.

[Claim 3] Said terminal is a video conference system according to claim 2 characterized by having the speaker selection processing section which chooses the MP3 data corresponding to [have the speaker selection Management Department which chooses a speaker as either said terminal or said server equipment, and sends out a selection signal to it with MP3 data, and] a speaker based on said selection signal, and sends out only the MP3 data concerned to said decoding section.

[Claim 4] Said server equipment is a video conference system according to claim 2 characterized by having the speaker selection processing section which chooses the MP3 data corresponding to [have the

speaker selection Management Department which chooses a speaker as either said terminal or said server equipment, and sends out a selection signal to it with MP3 data, and] a speaker based on said selection signal, and carries out streaming distribution only of the MP3 data concerned.

[Claim 5] It is the video conference system according to claim 2 to 4 which uses said image compressed data as MPEG-4 data, and is characterized by using said speech compression data as MP3 data.

[Claim 6] In the video conference system which has server equipment which manages connection and a communication link of a video conference system The server equipment which adopts the first coding method, and the first terminal which adopts the first coding method, It has transform-processing equipment which changes mutually the second terminal which adopts the second coding method, the first coding method, and the second coding method. Said first terminal The image input device which inputs image data, and the audio input unit which inputs voice data, The encoding processing section which encodes said image data and voice data to image compressed data and speech compression data (henceforth "multimedia data"), respectively, The decoding section which decrypts the multimedia data which have the transmitting processing section which transmits the multimedia data concerned to said server equipment, and were distributed from said server equipment to image data and voice data, respectively, It has the image output unit which was decrypted in the decoding section and which outputs the image data concerned, and the audio output device which outputs the voice data concerned. Said server equipment With the connection Management Department which manages said first terminal linked to a video conference system, and said transform-processing equipment It has the message distribution processing section which carries out streaming distribution to all the terminals that have managed all the multimedia data by which it is transmitted from said two or more terminals, and said selection signal at said connection Management Department. The image input port where said second terminal inputs image data, and the voice input port which inputs voice data, The image output port which outputs image data, and the audio output port which outputs voice data, It has the input/output processor which performs radial transfer between said transform-processing equipment while changing into the second coding method the image and voice data which are outputted and inputted in said port. Said transform-processing equipment is a video conference system characterized by having the function which changes mutually the coding method of the data transmitted from said server equipment or said second terminal, and is transmitted to another side, and having the function of said first terminal and said 2nd terminal.

[Claim 7] Said transform-processing equipment is a video conference system according to claim 6 characterized by having the speaker selection processing section which chooses the MP3 data corresponding to [have the speaker selection Management Department which chooses a speaker as either said first terminal, said second terminal or said server equipment, and sends out a selection signal to it with voice data or MP3 data, and] a speaker based on said selection signal, and sends out only the MP3 data concerned to said decoding section.

[Claim 8] Said server equipment is a video conference system according to claim 6 characterized by having the speaker selection processing section which chooses the MP3 data corresponding to [have the speaker selection Management Department which chooses a speaker as either said first terminal, said second terminal or said server equipment, and sends out a selection signal to it with MP3 data, and] a speaker based on said selection signal, and carries out streaming distribution only of the MP3 data concerned.

[Claim 9] It is the video conference system according to claim 6 to 8 which uses said image compressed data as MPEG-4 data, and is characterized by using said speech compression data as MP3 data.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the video conference system which connects mutually between remote places and performs a television conference.

[0002]

[Description of the Prior Art] In recent years, the video conference system which connects mutually among the many points in a remote place, and performs a television conference by development of communication technology has been developed. Such a video conference system has spread as a form based on an ITU-T recommendation. ITU-T transmitted and received an image and voice by call control (H. 225), communications control (H. 245), etc. between ISDN or the terminal of everything but IP screen oversize, and, specifically, has realized the television conference with the terminal (a H.320 terminal, H.323 terminal) based on H.320 (whole video conferencing terminals, such as ISDN, are specified) advised as an international-standards method of a video conference system, or H.323 (video conferencing terminals, such as IP network, are specified).

[0003] In order to realize the conventional video conference system which performs a television conference among these many points, the multi-point control unit (MCU: Multi-Point Control Unit) which carries out connection management of between the terminals between many points needs to be arranged. MCU has managed the terminal connected to the video conference system, and each terminal gets to know the transmission place of image data and voice data, and it consists of notifying the information on all the terminals that MCU equipment has connected to each terminal so that an image and voice data may be transmitted and received.

[0004] A television conference can be performed now also between a H.320 terminal and H.323 terminal by installing the gateway which carries an ISDN interface and a LAN interface and performs each protocol conversion by the request that he wants to extend the topology of a video conference system in recent years between an ISDN network and an ISDN network.

[0005] The video conference system between the many points in H.323 terminal connected with the H.320 terminal connected to the ISDN screen oversize as an example of such a conventional video conference system at LAN is explained with reference to drawing 9.

[0006] H. 323 terminals 101 are connected to LAN, and the H.320 terminal 102 is connected to LAN through the gateway unit 103 while connecting with ISDN. Moreover, on LAN, the MCU equipment 104 which performs connection management of the multi-point terminal which performs a television conference is connected.

[0007] H. 323 terminals 101 perform the connection request which includes the information in the end of a local to MCU equipment 104 via LAN in order to participate in a video conference system. MCU equipment 104 will notify the purport that managed the information on the terminal concerned and H.323 terminal 101 was connected to all the terminals by which current connection is made, with the information on the terminal concerned, if connection of H.323 terminal 101 is permitted. By this processing, H.323 terminal 101 becomes possible [performing a television conference].

[0008] Moreover, although the H.320 terminal 102 performs the connection request which includes the information in the end of a local like H.323 terminal, from the H.320 terminal 102, it transmits to gateway equipment 103 in a H.320 format, and it is that a gateway unit 103 changes the demand concerned into H.323 format, and a connection request is performed to MCU equipment 104.

Connection authorization processing is performed by this and the reverse root, and the purport that the H.320 terminal 102 was connected to all the terminals by which current connection is made is notified with the information on the terminal concerned like H.323 terminal 101. By this processing, the H.320 terminal 102 also becomes possible [performing a television conference].

[0009] Thus, the connected video conference system is a form based on an ITU-T recommendation, and a television conference will be performed by transmitting and receiving the data of H.323.

[0010]

[Problem(s) to be Solved by the Invention] In such a video conference system, since the television conference was held in the form based on an ITU-T recommendation, if the equipment which had to use a gateway unit 103 and MCU equipment 104 based on the ITU-T recommendation concerned, and was based on these ITU-T recommendations was not used, a television conference was not able to be held.

[0011] Since the data which a topology is restricted since there is nothing if a topology, a procedure, data format, etc. are not followed and it is **** in order to be based on an ITU-T recommendation, and communicate became large, it was difficult to spoil real time nature, if the large television conference of a scale is performed by narrow LAN of a band, and to build an efficient video conference system.

[0012] since compressibility is high for whether your being Haruka compared with the data format in the conventional video conference system, if there are MPEG-4, MP3, etc. as a high compression means of data, and the data of MPEG-4 or MP3 can perform a television conference now -- ***** -- since narrow LAN can also perform a real time television conference and the more flexible topology of it becomes possible, implementation of this video conference system is desired.

[0013]

[Means for Solving the Problem] Then, this invention is set to the video conference system which has the server equipment which manages connection and a communication link of a video conference system, and two or more terminals connected to the server equipment concerned in order to solve the above-mentioned technical problem. The image input device into which said terminal inputs image data, and the audio input unit which inputs voice data, With the connection Management Department which manages the terminal which has the transmitting processing section which transmits said image data and voice data to said server equipment, and connects said server equipment to a video conference system It has the message distribution processing section which carries out streaming distribution to all the terminals that have managed the speaker selection Management Department which chooses a speaker and sends out a selection signal, all the image data distributed from said two or more terminals, voice data, and said selection signal at said connection Management Department. Further said terminal The image output unit which displays the image data distributed from said server equipment, Suppose that it has the audio output device which outputs the voice data chosen from the selection signal and voice data which have been distributed from said server equipment in the speaker selection processing section which chooses the voice data corresponding to a speaker, and the speaker selection processing section concerned.

[0014] In the video conference system which has the server equipment which manages connection and a communication link of a video conference system, and two or more terminals connected to the server equipment concerned moreover, said terminal The image input device which inputs image data, and the audio input unit which inputs voice data, The encoding processing section which encodes said image data and voice data to image compressed data and speech compression data (henceforth "multimedia data"), respectively, It has the transmitting processing section which transmits the multimedia data concerned to said server equipment. Said server equipment It has the message distribution processing section which carries out streaming distribution to all the terminals that have managed the connection Management Department which manages the terminal linked to a video conference system, and all the multimedia data transmitted from said two or more terminals at said connection Management

Department. Furthermore, the decoding section which decrypts the image compressed data and speech compression data with which said terminal has been distributed from said server equipment to image data and voice data, respectively, Suppose that it has the image output unit which was decrypted in the decoding section and which outputs the image data concerned, and the audio output device which outputs the voice data concerned.

[0015] In this case, it has the speaker selection Management Department which chooses a speaker as either said terminal or said server equipment, and sends out a selection signal to it with MP3 data, and, as for said terminal, it is desirable to have the speaker selection processing section which chooses the MP3 data corresponding to a speaker based on said selection signal, and sends out only the MP3 data concerned to said decoding section.

[0016] Moreover, it has the speaker selection Management Department which chooses a speaker as either said terminal or said server equipment, and sends out a selection signal to it with MP3 data, and, as for said server equipment, it is desirable to have the speaker selection processing section which chooses the MP3 data corresponding to a speaker based on said selection signal, and carries out streaming distribution only of the MP3 data concerned.

[0017] Furthermore, said image compressed data is used as MPEG-4 data, and, as for said speech compression data, considering as MP3 data is desirable.

[0018] Moreover, it sets to the video conference system which has server equipment which manages connection and a communication link of a video conference system. The server equipment which adopts the first coding method, and the first terminal which adopts the first coding method, It has transform-processing equipment which changes mutually the second terminal which adopts the second coding method, the first coding method, and the second coding method. Said first terminal The image input device which inputs image data, and the audio input unit which inputs voice data, The encoding processing section which encodes said image data and voice data to image compressed data and speech compression data (henceforth "multimedia data"), respectively, The decoding section which decrypts the multimedia data which have the transmitting processing section which transmits the multimedia data concerned to said server equipment, and were distributed from said server equipment to image data and voice data, respectively, It has the image output unit which was decrypted in the decoding section and which outputs the image data concerned, and the audio output device which outputs the voice data concerned. Said server equipment With the connection Management Department which manages said first terminal linked to a video conference system, and said transform-processing equipment It has the message distribution processing section which carries out streaming distribution to all the terminals that have managed all the multimedia data by which it is transmitted from said two or more terminals, and said selection signal at said connection Management Department. The image input port where said second terminal inputs image data, and the voice input port which inputs voice data, The image output port which outputs image data, and the audio output port which outputs voice data, It has the input/output processor which performs radial transfer between said transform-processing equipment while changing into the second coding method the image and voice data which are outputted and inputted in said port. Suppose said transform-processing equipment that it has the function which changes mutually the coding method of the data transmitted from said server equipment or said second terminal, and is transmitted to another side.

[0019] In this case, it has the speaker selection Management Department which chooses a speaker as either said first terminal, said second terminal or said server equipment, and sends out a selection signal to it with voice data or MP3 data, and, as for said transform-processing equipment, it is desirable to have the speaker selection processing section which chooses the MP3 data corresponding to a speaker based on said selection signal, and sends out only the MP3 data concerned to said decoding section.

[0020] Moreover, it has the speaker selection Management Department which chooses a speaker as either said first terminal, said second terminal or said server equipment, and sends out a selection signal to it with MP3 data, and suppose said server equipment that it has the speaker selection processing section which chooses the MP3 data corresponding to a speaker based on said selection signal, and carries out streaming distribution only of the MP3 data concerned.

[0021] Moreover, said image compressed data is used as MPEG-4 data, and, as for said speech compression data, considering as MP3 data is desirable.

[0022]

[Embodiment of the Invention] Next, the gestalt of the 1st operation concerning this invention is explained with reference to a drawing. Drawing 1 is drawing having shown an example of the topology of the video conference system (MPEG-4 system) concerning this invention. On LAN, the terminals 1 and 2 which are two or more MPEG-4 terminals, and the server equipment 3 which performs connection and communications control of a video conference system are connected. Although two or more MPEG-4 terminals are connected on LAN in fact, two sets only of MPEG-4 terminals are explained as an example for convenience.

[0023] The image input unit 4 which carries out the capture of the image from a camera etc. so that terminals 1 and 2 may be illustrated by drawing 2, The encoding (coding) processing section 5 which compresses into MPEG-4 the image which carried out the capture with the image input device 4, The MPEG-4 data transmitting processing section 6 which transmits MPEG-4 data encoded by MPEG-4 to server equipment 3 through LAN in the encoding processing section 5, The audio input unit 7 which carries out [voice] a capture from a microphone etc., and the encoding (coding) processing section 8 which compresses into MP3 the voice which carried out the capture with the audio input unit 7, It has the MP3 data transmitting processing section 9 which transmits the MP3 data encoded by MP3 to server equipment 3 through LAN in the encoding processing section 8. Moreover, the MPEG-4 data reception section 13 which receives MPEG-4 data sent through LAN from server equipment 3, and is sent out to the processing [degree] section, The decoding section 12 which decodes MPEG-4 data sent from the MPEG-4 data reception section 13 to image data, The image output unit 11 which displays the image decoded in the decoding section 12 on a display etc., The MP3 data reception section 17 which receives the selection signal which chooses from server equipment 3 the speaker of the MP3 data sent through LAN, and a television conference, and is sent out to the processing [degree] section, The speaker selection processing section 16 which chooses the MP3 data from a speaker terminal based on a selection signal, and is sent out to the processing [degree] section, The decoding section 15 which decodes the MP3 data chosen in the speaker selection processing section 16 to voice data, With the connection Management Department 18 which has the audio output device 14 which outputs the voice decoded in the decoding section 15 to a loudspeaker etc., and performs connection processing to a video conference system further The control unit 19 which operates connection Management Department 18 grade, and MPEG-4 data and MP3 data (it is called "multimedia data" below.) It consists of LAN interfaces 10 which carry out an interface between LANs.

[0024] Here, the low bit rate coding method of the image towards the communication link of the Internet etc. and voice is said in MPEG-4, the compression approach differs from means of communications, and MPEG-2 are characterized by compressibility being higher than MPEG-2 about 10 times. Moreover, MP3 (MPEG-1 Audio Layer 3) means the audio compression technology of MPEG-1 which is the compression technology of an image, and is the speech compression means by which compressibility is present the highest.

[0025] Although an image and voice are divided, transmitted and received to MPEG-4 data and MP3 data in this example, in order for voice data to choose only the voice data from a speaker to displaying all image data and to make it output to a loudspeaker etc. from an audio output device 14, it divides, encodes and *****, so that this may be explained later.

[0026] The LAN interface 20 with which a server 3 performs LAN and an interface as shown in drawing 3, The MPEG-4 reception section 21 which receives inner MPEG-of multimedia data 4 data, The MPEG-4 data message distribution processing section 22 which distributes MPEG-4 data received in the MPEG-4 reception section 21 to all the terminals connected to the video conference system, The MP3 reception section 23 which receives the MP3 data in multimedia data, While the television conference is held with the MP3 data message distribution processing section 24 which distributes the MP3 data received in the MP3 reception section 23 to all the terminals connected to the video conference system, on the screen (not shown) of server equipment 3 It consists of a control unit 29 which chooses which

terminal a voice is given, and the speaker selection Management Department 30 which distributes the selection signal which specified the terminal chosen by the control unit 29 to all terminals.

[0027] With moreover, the connection terminal IP address Management Department 26 where the connection Management Department 25 manages the IP address (henceforth an "IP address") of the terminal connected to the video conference system The access permit list 27 which has identification information, such as an IP address of the terminal which may participate in a video conference system, In case it communicates with a video conference system, communication link information (henceforth "communication link information"), such as a possible bit rate and a frame rate, is set up, and it consists of the data setting Management Department 28 which manages the set-up communication link information for every terminal.

[0028] In addition, although the speaker is chosen by the control unit 29 of server equipment 3 in this example, other approaches generally found are sufficient as the selection approach concerned, and it is also possible to perform speaker selection by the same approach at other terminals.

[0029] Next, as actuation of this example, the case where a terminal 1 and a terminal 2 perform a television conference is explained, referring to drawing 4.

[0030] In order that a terminal 1 may participate in a television conference, the connection Management Department 18 sends out a connection-request signal to server equipment 3. If server equipment 3 receives the connection-request signal from a terminal 1, the connection Management Department 25 will perform the existence of the number limit of connection terminals, and television conference participating authorization, and a multimedia data setting situation check by the connection terminal IP address Management Department 26, the access permit list 27, and the data setting Management Department 28.

[0031] First, although it is the number limit of connection terminals, since the IP address of a terminal which is making current connection at the connection terminal IP address Management Department 26 is managed, if the number of connection terminals concerned is compared with the number of management permissible terminals and the number of connection terminals has reached the number of management permissible terminals, a connection disapproval signal will be sent out to a terminal 1, and a connection request will be canceled. If the number of management permissible terminals is not reached, the existence of television conference participating authorization is judged next.

[0032] Since it has as a list the IP address of the terminal which may participate in a video conference system, whether the IP address of a terminal 1 is included in the list concerned judges an access permit list 27, and if not contained, it is judged to be what participation of a television conference is not permitted, sends out a connection disapproval signal to a terminal 1, and cancels a connection request. If contained in the list concerned, a multimedia data setting situation check will be performed next.

[0033] Since the communication link information which can communicate is set up, when it judges whether it is the range of the communication capability permitted at the data setting Management Department 28 and is over communication capability from the communication link information on the communication link of the terminal 1 included in the connection-request signal from the terminal 1, the data setting Management Department 28 sends out a connection disapproval signal to a terminal 1, and cancels a connection request. While it begins when it is not over communication capability, and transmitting a connection enabling signal to a terminal 1, the IP address and communication link information on a terminal 1 are recorded on the connection Management Department 25.

[0034] It can recognize that the terminal 1 was connectable with the video conference system by receiving the connection enabling signal from server equipment 3 at the connection Management Department 18, and, thereby, a terminal 1 can participate in a video conference system.

[0035] In order that a terminal 2 may also participate in a television conference, the same connection processing as a terminal 1 is performed.

[0036] Next, the actuation in television conference session is explained.

[0037] The terminal 1 which obtained connection authorization carries out the capture of the image data from a camera etc. with the image input device 4, and carries out the capture of the voice data from a microphone etc. with an audio input unit 7. If the image data which carried out the capture with the

image input device 8 are received, with MPEG-4 codec software etc., the encoding processing section 5 will encode the image data concerned to MPEG-4 data, and will transmit to the MPEG-4 data message distribution processing section 6.

[0038] On the other hand, if the voice data which carried out the capture with the audio input unit 7 is received, with MP3 codec software etc., the encoding processing section 8 will carry out MP3 coding of the voice data concerned, and will transmit to the MP3 data message distribution processing section 9.

[0039] In addition, each encoding processing section 5 and 8 analyzed the coding processing situation of another side, delayed coding of 1 in all side to coding processing of the direction with much delay, and it has transmitted to the MPEG-4 data message distribution processing section 6 and the MP3 data message distribution processing section 9, taking both synchronizations.

[0040] The MPEG-4 data transmitting processing section 6 and the MP3 data transmitting processing section 9 set up a server 3 as each transmission place, and transmit multimedia data to server equipment 3 through LAN.

[0041] If a server 3 receives multimedia data with the LAN interface 20, MPEG-4 data will be sent to the MPEG-4 data reception section 21 among the multimedia data concerned, and MP3 data will be sent to the MP3 data reception section 23. This multimedia data is sent to the MPEG-4 data message distribution processing section 22 and the MP3 data message distribution processing section 24 in a format as it is, and the MPEG-4 data message distribution processing section 22 and the MP3 data message distribution processing section 24 set up the IP address of the terminal registered into the connection terminal IP address Management Department 26 of the connection Management Department 25 as a transmission place of multimedia data which received, respectively, and carry out multicast (streaming) distribution through the LAN interface 20 at LAN. Thus, server equipment 3 is carrying out streaming distribution of the multimedia data transmitted from all the terminals linked to a video conference system in the format as it is at LAN, without processing the received multi-DIA data. thereby, the real time nature in server equipment 3 is markedly alike, and improves.

[0042] Moreover, during television conference holding, in server equipment 3, a speaker is recognized from a display (not shown) and speaker selection is made by the control unit 29. The speaker selection Management Department 30 investigates the terminal corresponding to the speaker chosen by the control unit 29, and the selection signal concerned which specifies a speaker with the MP3 data from the MP3 data message distribution processing section 24 also carries out streaming distribution together.

[0043] If streaming distribution of the multimedia data is carried out from server equipment 3, the data addressed to the end of a local judge whether it is no at the LAN interface 10, and if the terminals 1 and 2 linked to a video conference system are data addressed to the end of a local, they will incorporate the multimedia data concerned.

[0044] MPEG-4 data are received in the MPEG-4 data reception section 13 among this incorporated multimedia data, and MP3 data and a selection signal are received in the MP3 data reception section 17. If MPEG-4 data received in the MPEG-4 data reception section 13 are received, with MPEG-4 codec software etc., the decoding section 12 will decrypt the MPEG-4 data concerned to image data, and will transmit to the image output unit 11. At this time, it processes so that there may be the image output-control processing section (not shown) which performs processing of the display screen for television conferences etc. along the display setting screen for television conferences set up in the end of a local and the image data from each terminal may be displayed. That is, the image data (MPEG-4 data) sent from each terminal is distributed without being processed in any way, and he is trying to display it at this example by the display format for television conferences which began in the end of a local and was set up beforehand. Carrying out comparatively [division-into-equal-parts], or displaying only a speaker, or making a speaker a rise and carrying out others comparatively [division-into-equal-parts] as an example of a display, etc. is considered.

[0045] On the other hand, from a selection signal, the speaker selection processing section 16 will choose only the MP3 data from the terminal corresponding to the speaker concerned, and the MP3 data reception section 17 will transmit it to the decoding section 15, if the MP3 data and the selection signal which were received are transmitted to the speaker selection processing section 16. If the MP3 data

chosen in the speaker selection processing section 16 are received, with MP3 codec software etc., the decoding section 15 will decrypt the MP3 data concerned to voice data, and will transmit to an audio output device 14. Here, it transmitted to the decoding section 15 and since the real time nature in a television conference would fall with the load of processing if all MP3 data are decrypted, only the MP3 data corresponding to a speaker were decrypted for making only the MP3 data corresponding to the speaker who is necessary minimum decrypt.

[0046] In addition, each decoding section 12 and 19 analyzed the decryption processing situation of another side, delayed the decryption of 1 in all side to decryption processing of the direction with much delay, and it has transmitted to the image output unit 11 and the audio output device 14, taking both synchronizations.

[0047] Thus, the image data and voice data which were decrypted display an image on displays, such as a display, with the image output unit 11, and voice is outputted to a loudspeaker etc. from an audio output device 14.

[0048] By performing such processing, a television conference can be performed between a terminal 1 and 2.

[0049] Next, the gestalt of the 2nd operation concerning this invention is explained. Although the gestalt of the 1st operation explained the video conference system of MPEG-4 terminals, the video conference system which also includes H.323 terminal here is explained.

[0050] Drawing 5 is drawing having shown the topology of the video conference system in the gestalt of the 2nd operation. The transform-processing equipment 33 which changes between server equipment 3, the terminal 31 which is MPEG-4 terminal, H.323 terminal 34 based on H.323, and MPEG-4 format and H.323 format is connected to this video conference system by LAN.

[0051] Since the configuration of server equipment 3 and a terminal 31 is the same as that of the server equipment 3 and the terminals 1 and 2 which were explained with the gestalt of the 1st operation, it omits explanation.

[0052] H. 323 terminals 32 are equipped with the image voice-input/output processor 45 which performs radial transfer of H.323 formal data between the image input port 41 which inputs an image from video etc., the voice input port 42 which inputs voice from a microphone etc., the image output port 43 which displays an image on a display etc., the audio output ports 44 which output voice to a loudspeaker etc., and these ports and LANs as shown in drawing 7.

[0053] Transform-processing equipment 33 shows what combined MPEG-4 terminal 47 and H.323 terminal 46 with the gestalt of this operation, as shown in drawing 6, but if it has the function of MPEG-4 terminal 47 and the function of H.323 terminal 46 which are shown below, it is sufficient for it.

[0054] The image output port 36 and audio output port 37 of H.323 terminal 46 are connected with the image input unit 4 of MPEG-4 terminal 47, and an audio input unit 7, respectively, and the image output unit 11 and audio output device 14 of MPEG-4 terminal 47 are connected with the image input port 34 of H.323 terminal 46, and the voice input port 35 for transform-processing equipment 33, respectively. In addition, since the configuration of H.323 terminal and MPEG-4 terminal is the same in having described above, explanation here is omitted.

[0055] Next, as actuation of this example, the case where H.323 terminal 32 and a terminal 31 perform a television conference is explained with reference to drawing 8.

[0056] In order that a terminal 31 and transform-processing equipment 32 (MPEG-4 terminal part) may participate in a television conference first, a connection request is performed from the connection Management Department 18 to server equipment 3, and a terminal 31 and transform-processing equipment 35 are connected to a video conference system by the same processing as the gestalt of the 1st operation. Thereby, transform-processing equipment 35 will be in a ready-for-sending ability condition about multimedia data to server equipment 3, and the distribution from server equipment 3 will also be in a ready-for-receiving ability condition.

[0057] Then, H.323 terminal 32 will be substantially connected to a video conference system by performing connection processing with the transform-processing equipment 33 connected to the video

conference system.

[0058] Next, the actuation in television conference session is explained with reference to drawing 8. In addition, drawing 8 is the flow chart which showed the actuation in transform-processing equipment 33.

[0059] H. 323 terminals 32 are the image I/O 36 about the image data from a camera etc., and if the capture of the voice data is carried out with voice-input/output equipment 37 from a microphone etc., the image voice-input/output processor 45 will encode the data concerned which carried out the capture in H.323 format which is digital data, and they will transmit the H.323 data concerned to transform-processing equipment 33 through LAN.

[0060] With transform-processing equipment 33, H.323 data inputted through LAN are changed into multimedia data, and the multimedia data concerned are transmitted to a server. If an input/output processor 40 receives H.323 data from H.323 terminal 32 through LAN, the H.323 data concerned will be changed into the data (henceforth "analog data") of a composite image and an analog phonological form, and, specifically, the analog data concerned will be outputted to the image input unit 4 and an audio input unit 7 from the image output port 43 and an audio output port 44. In addition, the image output port 36, the image input unit 4, and an audio output port 37 and an audio input unit 5 are offered at H.323 conventional terminal and MPEG-4 terminal, and are mutually connected in a camera, a microphone, a display, and a loudspeaker terminal. The same is said of the image output unit 11 explained later, image input port 34 and an audio output device 14, and the voice input port 35.

[0061] At MPEG-4 terminal of transform-processing equipment 33, if the capture of the image input-device 4 and audio input unit 7 analog data is carried out, the analog data concerned will be sent to the encoding processing sections 5 and 8. The encoding processing sections 5 and 8 encode each analog data to MPEG-4 and MP3, and transmit to server equipment 3 through LAN. Same processing is performed with the gestalt of the 1st operation having explained these transmitting processings and the message distribution processing in server equipment 3.

[0062] If multimedia data are distributed from server equipment 3, transform-processing equipment 33 will receive MPEG-4 data in the MPEG-4 data reception section 13 of MPEG-4 terminal in self-equipment, and will receive MP3 data and a selection signal in the MP3 data reception section 17.

[0063] The decoding section 12 will decode MPEG-4 data to a composite video signal, if MPEG-4 data are received from the MPEG-4 data reception section 13, and if the MP3 data chosen in the speaker selection processing section are received, the decoding section 15 decodes the MP3 data concerned to analog voice, and it sends it out to H.323 terminal 46 from the image output unit 11 and an audio output device 14, respectively.

[0064] H. The voice image input/output processor 40 will encode the analog data concerned to H.323 data, and 323 terminals 46 will transmit it to H.323 terminal 32, if the analog data concerned is received in image input port 34 and the voice input port 35.

[0065] H. The image voice-input/output processor 45 of 323 terminals 32 carries out the capture of the analog data received from image input port 41 and the voice input port 42, displays an image on a display from the image output port 43, and makes voice output to a loudspeaker from an audio output port 44.

[0066] By performing such processing, a television conference can be performed between the terminals with which protocols differ, without being mutually conscious of the difference in a protocol.

[0067]

[Effect of the Invention] Since server equipment manages the information on the terminal linked to a video conference system according to this invention as explained above and each terminal distributes a multimedia signal to all the terminals to which server equipment was connected that what is necessary is to transmit a multimedia signal only to server equipment, load reduction in each terminal can be aimed at.

[0068] Moreover, since coding methods, such as MPEG-4 which are a high compression method, and MP3, can be treated, even if it is LAN which is the narrow network of a band, a network will be in a congestion condition neither by each terminal - transmission nor distribution from server equipment, but the high video conference system of real time nature can be held.

[0069] Furthermore, by encoding image data and voice data with another coding method, in case the voice data corresponding to a speaker is chosen, image data can be independently chosen now and can simplify the equipment for speaker selection.

[0070] Moreover, a video conference system with more high real time nature can be held by decrypting only the encoded voice data corresponding to a speaker.

[0071] Furthermore, since it becomes possible to constitute a video conference system only from a configuration which makes the transform-processing equipment which can use MPEG-4 general-purpose terminal, H.323 terminal, etc. as it is mediate even if it faces holding a television conference between the terminals of different specification and does not install an expensive dedicated terminal, a video conference system can be constituted more flexibly and cheaply.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the video conference system which connects mutually between remote places and performs a television conference.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] In recent years, the video conference system which connects mutually among the many points in a remote place, and performs a television conference by development of communication technology has been developed. Such a video conference system has spread as a form based on an ITU-T recommendation. ITU-T transmitted and received an image and voice by call control (H. 225), communications control (H. 245), etc. between ISDN or the terminal of everything but IP screen oversize, and, specifically, has realized the television conference with the terminal (a H.320 terminal, H.323 terminal) based on H.320 (whole video conferencing terminals, such as ISDN, are specified) advised as an international-standards method of a video conference system, or H.323 (video conferencing terminals, such as IP network, are specified).

[0003] In order to realize the conventional video conference system which performs a television conference among these many points, the multi-point control unit (MCU:Multi-Point Control Unit) which carries out connection management of between the terminals between many points needs to be arranged. MCU has managed the terminal connected to the video conference system, and each terminal gets to know the transmission place of image data and voice data, and it consists of notifying the information on all the terminals that MCU equipment has connected to each terminal so that an image and voice data may be transmitted and received.

[0004] A television conference can be performed now also between a H.320 terminal and H.323 terminal by installing the gateway which carries an ISDN interface and a LAN interface and performs each protocol conversion by the request that he wants to extend the topology of a video conference system in recent years between an ISDN network and an ISDN network.

[0005] The video conference system between the many points in H.323 terminal connected with the H.320 terminal connected to the ISDN screen oversize as an example of such a conventional video conference system at LAN is explained with reference to drawing 9.

[0006] H. 323 terminals 101 are connected to LAN, and the H.320 terminal 102 is connected to LAN through the gateway unit 103 while connecting with ISDN. Moreover, on LAN, the MCU equipment 104 which performs connection management of the multi-point terminal which performs a television conference is connected.

[0007] H. 323 terminals 101 perform the connection request which includes the information in the end of a local to MCU equipment 104 via LAN in order to participate in a video conference system. MCU equipment 104 will notify the purport that managed the information on the terminal concerned and H.323 terminal 101 was connected to all the terminals by which current connection is made, with the information on the terminal concerned, if connection of H.323 terminal 101 is permitted. By this processing, H.323 terminal 101 becomes possible [performing a television conference].

[0008] Moreover, although the H.320 terminal 102 performs the connection request which includes the information in the end of a local like H.323 terminal, from the H.320 terminal 102, it transmits to gateway equipment 103 in a H.320 format, and it is that a gateway unit 103 changes the demand concerned into H.323 format, and a connection request is performed to MCU equipment 104.

Connection authorization processing is performed by this and the reverse root, and the purport that the

H.320 terminal 102 was connected to all the terminals by which current connection is made is notified with the information on the terminal concerned like H.323 terminal 101. By this processing, the H.320 terminal 102 also becomes possible [performing a television conference].
[0009] Thus, the connected video conference system is a form based on an ITU-T recommendation, and a television conference will be performed by transmitting and receiving the data of H.323.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since server equipment manages the information on the terminal linked to a video conference system according to this invention as explained above and each terminal distributes a multimedia signal to all the terminals to which server equipment was connected that what is necessary is to transmit a multimedia signal only to server equipment, load reduction in each terminal can be aimed at.

[0068] Moreover, since coding methods, such as MPEG-4 which are a high compression method, and MP3, can be treated, even if it is LAN which is the narrow network of a band, a network will be in a congestion condition neither by each terminal - transmission nor distribution from server equipment, but the high video conference system of real time nature can be held.

[0069] Furthermore, by encoding image data and voice data with another coding method, in case the voice data corresponding to a speaker is chosen, image data can be independently chosen now and can simplify the equipment for speaker selection.

[0070] Moreover, a video conference system with more high real time nature can be held by decrypting only the encoded voice data corresponding to a speaker.

[0071] Furthermore, since it becomes possible to constitute a video conference system only from a configuration which makes the transform-processing equipment which can use MPEG-4 general-purpose terminal, H.323 terminal, etc. as it is mediate even if it faces holding a television conference between the terminals of different specification and does not install an expensive dedicated terminal, a video conference system can be constituted more flexibly and cheaply.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] In such a video conference system, since the television conference was held in the form based on an ITU-T recommendation, if the equipment which had to use a gateway unit 103 and MCU equipment 104 based on the ITU-T recommendation concerned, and was based on these ITU-T recommendations was not used, a television conference was not able to be held.

[0011] Since the data which a topology is restricted since there is nothing if a topology, a procedure, data format, etc. are not followed and it is **** in order to be based on an ITU-T recommendation, and communicate became large, it was difficult to spoil real time nature, if the large television conference of a scale is performed by narrow LAN of a band, and to build an efficient video conference system.

[0012] since compressibility is high for whether your being Haruka compared with the data format in the conventional video conference system, if there are MPEG-4, MP3, etc. as a high compression means of data, and the data of MPEG-4 or MP3 can perform a television conference now -- ***** -- since narrow LAN can also perform a real time television conference and the more flexible topology of it becomes possible, implementation of this video conference system is desired.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing having shown the topology of the 1st video conference system concerning this invention.

[Drawing 2] The block diagram having shown MPEG-4 terminal in the gestalt of the 1st operation.

[Drawing 3] The block diagram having shown the server equipment in the gestalt of the 1st operation.

[Drawing 4] The flow chart in the video conference system of the MPEG-4 terminals in the gestalt of the 1st operation.

[Drawing 5] Drawing having shown the topology of the 2nd video conference system concerning this invention.

[Drawing 6] The block diagram having shown H.323 terminal in the gestalt of the 2nd operation.

[Drawing 7] The block diagram having shown the transform-processing equipment in the gestalt of the 2nd operation.

[Drawing 8] The flow chart in the video conference system of the H.323 terminal and MPEG-4 terminal in the gestalt of the 2nd operation.

[Drawing 9] Drawing having shown the topology of the video conference system between the conventional H.320 terminal and H.323 terminal.

[Description of Notations]

- 1 Two MPEG-4 terminal
- 3 Server Equipment
- 4 Image Input Unit
- 5 Eight Encoding processing section
- 6 MPEG-4 Data Transmitting Processing Section
- 7 Audio Input Unit
- 9 MP3 Data Transmitting Processing Section
- 10 20 LAN interface
- 11 Image Output Unit
- 12 15 Decoding section
- 13 MPEG-4 Data Reception Section
- 14 Audio Output Device
- 16 Speaker Selection Processing Section
- 17 MP3 Data Receive Section
- 18 Connection Management Department
- 19 Control Unit
- 21 MPEG-4 Data Reception Section
- 22 MPEG-4 Data Message Distribution Processing Section
- 23 MP3 Data Reception Section
- 24 MP3 Data Message Distribution Processing Section
- 25 Connection Management Department

- 26 Connection Terminal IP Address Management Department
- 27 Access Permit List
- 28 Data Setting Management Department
- 29 Control Unit
- 30 Speaker Selection Management Department
- 31 MPEG-4 Terminal
- 32 H.323 Terminal
- 33 Transform-Processing Equipment
- 34 41 Image input port
- 35 42 Voice input port
- 36 43 Image output port
- 37 44 Audio output port
- 40 45 Image voice-input/output processor
- 46 H.323 Terminal
- 47 MPEG-4 Terminal

[Translation done.]

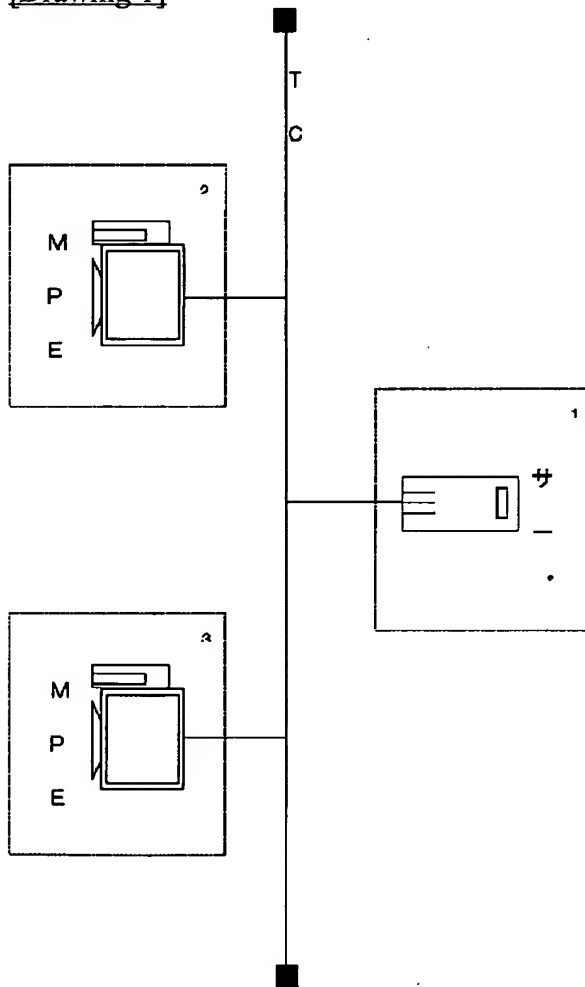
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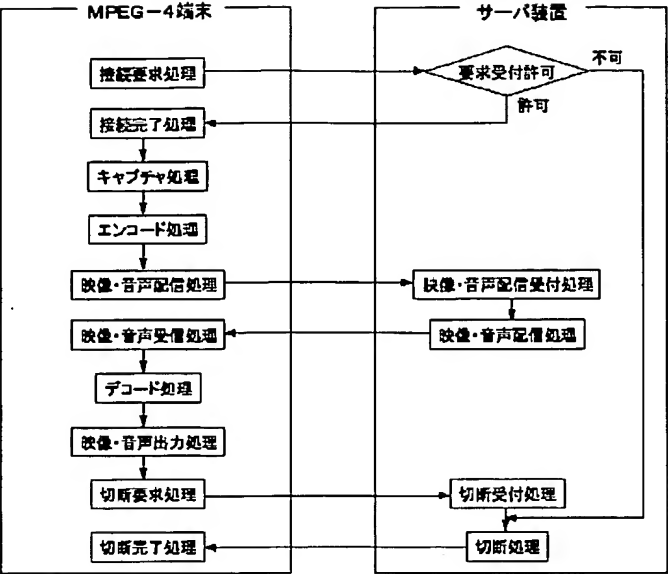
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DRAWINGS

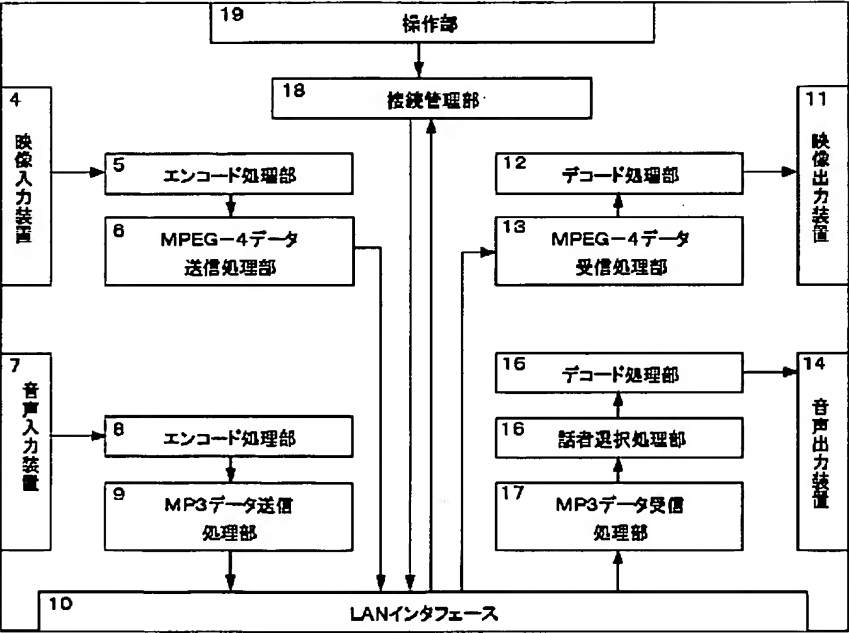
[Drawing 1]



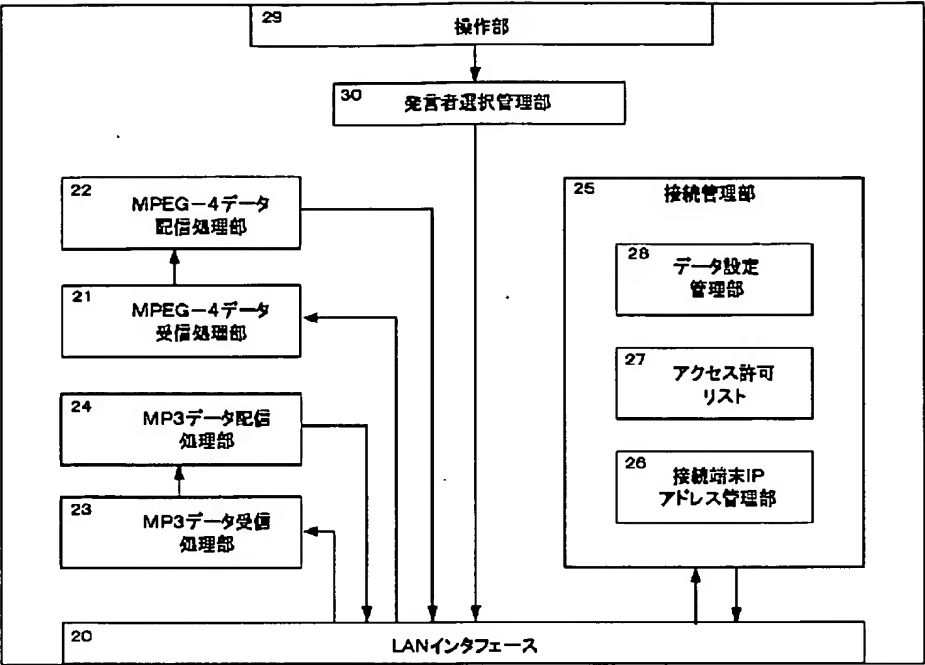
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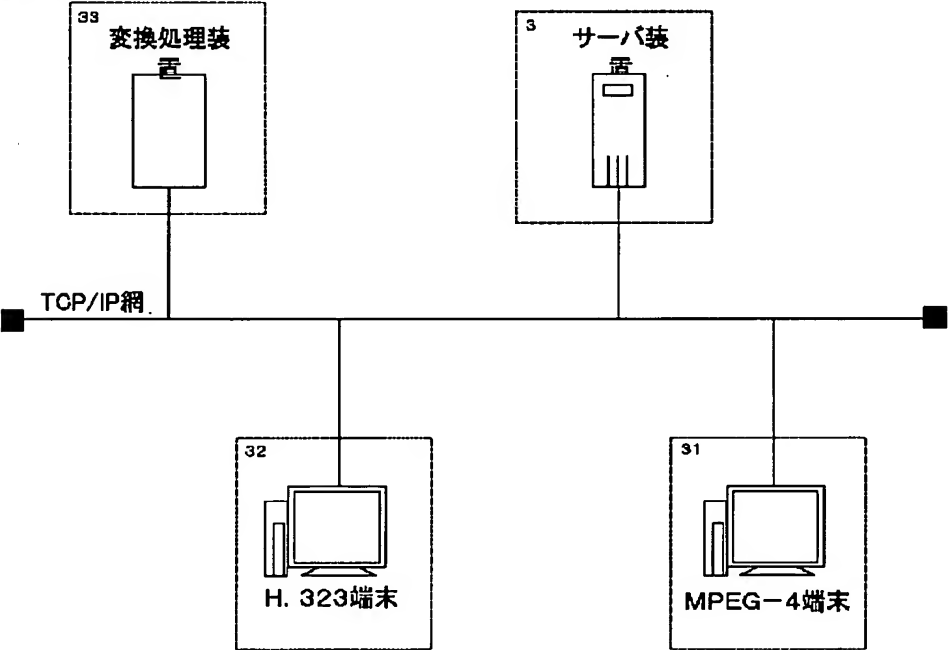
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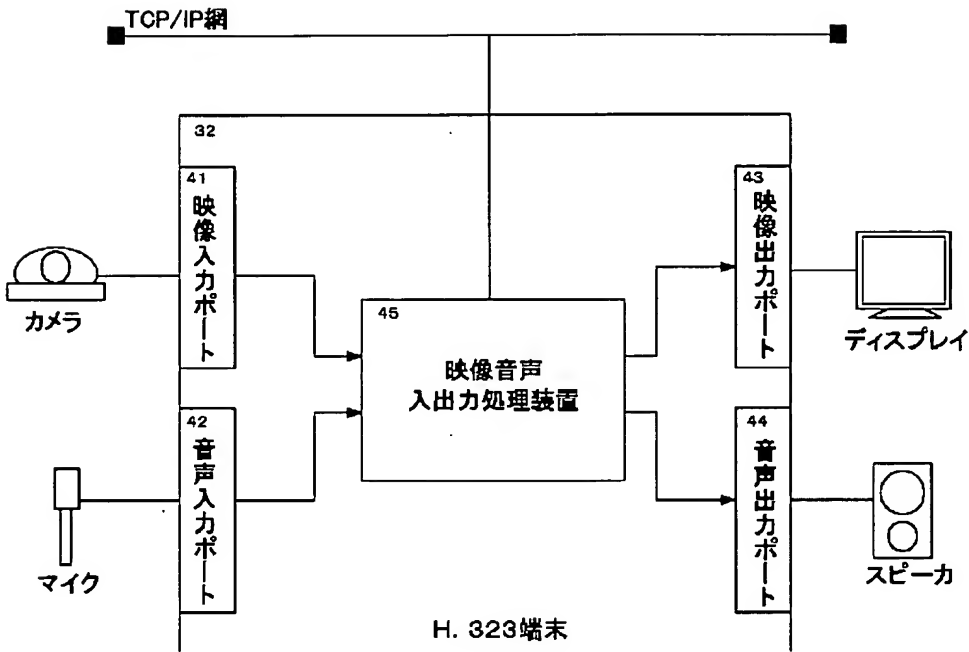
[Drawing 3]



[Drawing 5]



[Drawing 7]

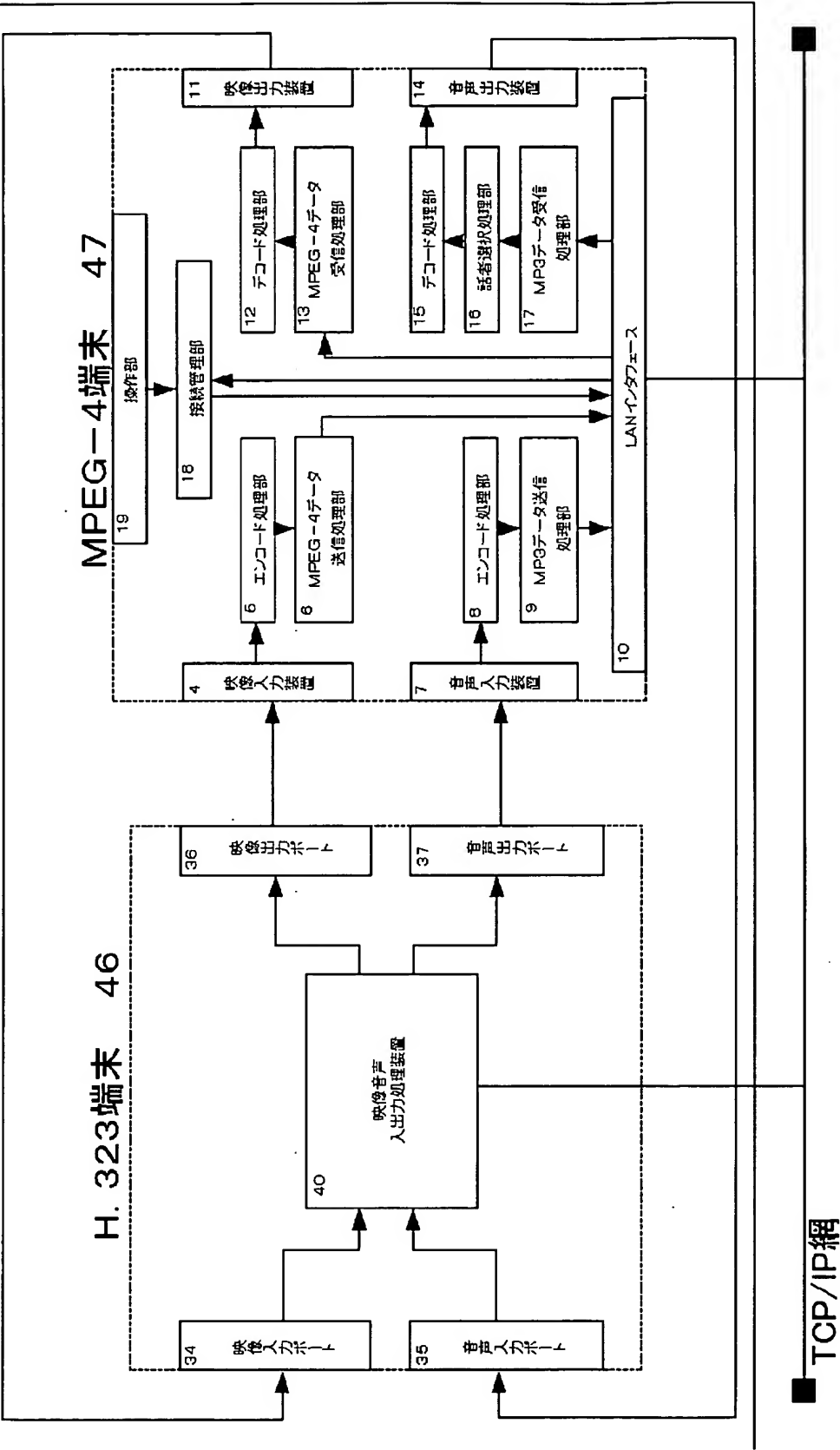


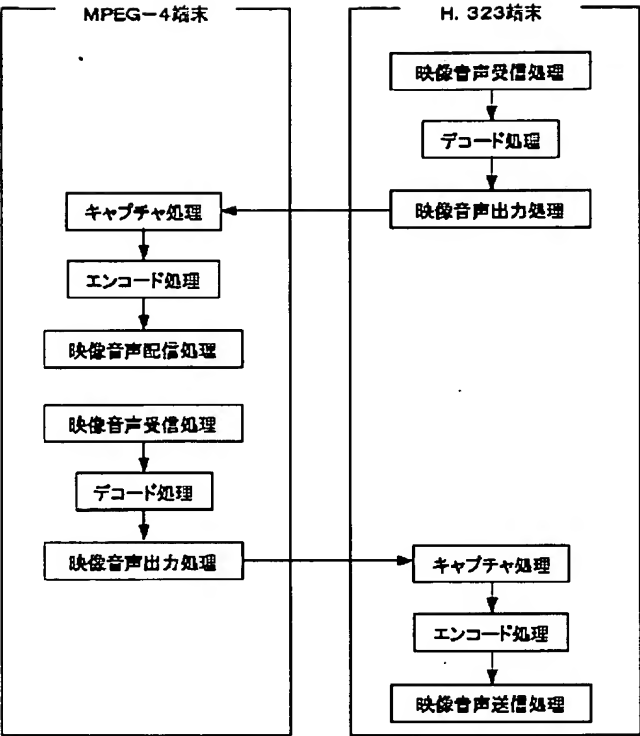
[Drawing 6]

変換処理装置

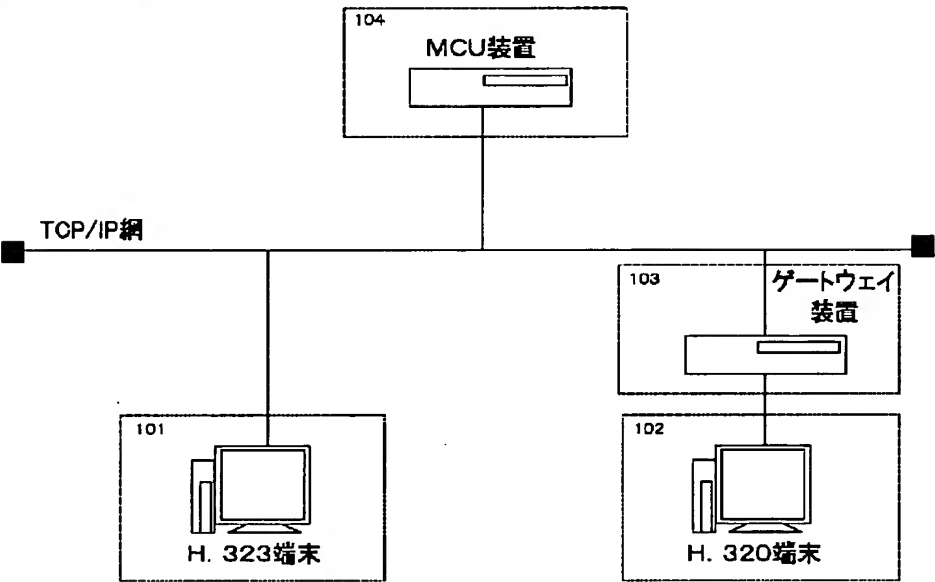
33

[Drawing 8]





[Drawing 9]



[Translation done.]